

Express Mail Label No.: EV242754784US

Date of Deposit: February 11, 2004

**Atty. Docket No.: 25436/1344 PATENT**  
**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application of:	Carstens
Serial No.:	Not yet assigned
Filed:	February 11, 2004
Entitled:	Methods and Compositions for High Level Expression of A Heterologous Protein With Poor Codon Usage

**Mail Stop Patent Application**  
**Commissioner for Patents**  
**P.O. Box 1450**  
**Alexandria, VA 22313-1450**

**INFORMATION DISCLOSURE STATEMENT**  
**UNDER 37 CFR §§ 1.56, 1.97 AND 1.98**

Dear Sir:

In accordance with the duty of disclosure under 37 CFR § 1.56, Applicant submits this Information Disclosure Statement pursuant to 37 CFR §§ 1.97 and 1.98 in the above-identified application for consideration by the Patent Office.

A listing of the cited documents is also enclosed. Please note that copies of these references were filed in the parent application 09/492,590.

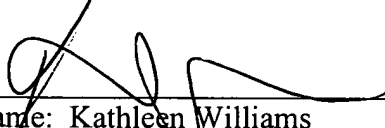
Pursuant to CFR § 1.97(b)(3), because this Statement is being submitted before the first Office Action on the merits, no fee is required.

Applicant does not intend to represent that any of the documents submitted herein are material prior art to this invention or that the list represents an exhaustive search of documents related to this invention.

Applicant respectfully requests that the documents submitted herein be considered and made of record in this application.

Respectfully submitted,

Date: February 11, 2004

  
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USPTO Form 1449 U.S. Department of Commerce Patent and Trademark Office				Attorney Docket No. 25436/1344		Serial No. Not yet assigned	
INFORMATION DISCLOSURE STATEMENT				Applicant(s): Carstens, Carsten-Peter			
				Filing Date: February 11, 2004		Group: Not yet assigned	
U.S. PATENT DOCUMENTS							
Examiner Initial		Patent No.	Date	Name	Class	Subclass	Filing Date (if appropriate)
		6,270,988	August 7, 2001	Brinkmann, et al.	435	69.1	
FOREIGN PATENT DOCUMENTS							
Examiner Initial		Document No.	Date	Country	Class	Subclass	Translation
							YES NO
OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)							
		Kane, J.F., "Effects of rare codon clusters on high-level expression of heterologous proteins in <i>Escherichia coli</i> ", <i>Current Opinion in Biotechnology</i> 6:494-500 (1995);					
		Bonekamp, et al, "Codon-defined ribosomal pausing in <i>Escherichia coli</i> detected by using the pyer attenuator to probe the coupling between transcription and translation", <i>Nucleic Acid Res</i> 13:4113-23 (1985);					
		Deana, A., et al. "Silent Mutations in the <i>Escherichia coli</i> ompa leader peptide region strongly affect transcription and translation in vivo", <i>Nucleic Acids Res</i> 26:4778-4782 (1998);					
		Rosenberg, A.H., et al., "Effects of consecutive AGG codons on translation in <i>Escherichia coli</i> , demonstrated with a versatile codon test system" <i>J. Bacteriol</i> 175:716-22 (1993);					
		Goldman, E., et al., "Consecutive low usage leucine codons block translation only when near the 5' end of a message in <i>Escherichia coli</i> " <i>J. Mol. Biol.</i> 245:467-73(1995);					
		Degryse, E., "Influence of the second and third codon on the expression of recombinant hirudin in <i>E. coli</i> " <i>FEBS Lett</i> , 269:244-6 (1990);					
		Spanjaard, R.A., et al., "Frameshift suppression at tandem AGA and AGG Codons by cloned tRNA genes: assigning a codon to argu tRNA and T4 tRNA (Arg)", <i>Nucleic Acids Res.</i> 18:5031-6 (1990);					
		Kane, J.F., et al, "Novel in frame two codon translationalhop during synthesis of bovine placental lacotogen in a recombinant strain of <i>Escherichia coli</i> ", <i>Nucleic Acids Res.</i> 20:6707-12 (1992);					
		Calderone, T.L., et al., "High-level misincorporation of lysine for arginine at AGA codons in a fusion protein expressed in <i>Escherichia coli</i> ", <i>J. Mol. Biol</i> 262: 407-12 (1996);					
		Forman, M.D., et al "High level, context dependent misincorporation of lysine for arginine in <i>Saccharomyces cerevisiae</i> a 1 homodomain expressed in <i>Escherichia coli</i> ", <i>Protein Sci</i> 7:500-3 (1998);					
		Brinkman, et al. "High level expression of recombinant genes in <i>Escherichia coli</i> is dependent on the availability of the dna Y gene product", <i>Gene</i> 85:109-14 (1989);					

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Examiner Initial		Document No.	Date	Country	Class	Subclass	Translation
							YES NO
OTHER DOCUMENTS (including Author, Title, Date, Pertinent Pages, etc.)							
		Hua, et al, "Enhancement of Expression of human granulocyte-macrophage colony stimulating factor by argu gene product in escherichia coli" <i>Biochem Mol. Biol. Int.</i> 32:537-43 (1994);					
		Chen, et al., "Role of the AGA/AGG codons, the rarest codons in global gene expression in Escherichia coli" <i>Genes Dev</i> 8:2641-52 (1994);					
		Garcia, et al., "The argU Gene product enhances expression of the recombinant human interferon in Escheria coli" <i>Ann N.Y. Acad Sci</i> 782:79-86;					
		Kim, et al., "Overexpression of archael proteins in Escherichia coli" <i>Biotech. Lett</i> 20:207-210 (1998);					
		Rojiani, et al. "Relationship between protein synthesis and concentrations of charged and uncharged tRNA in Escheria Coli" <i>Proc. Nat. Acad. Sci U.S.A.</i> 87:1511-1515 (1990);					
		Sharp, et al., "Codon usage in regulatory genes in Escherichia coli does not reflect selevtion for rare codons" <i>Nucleic Acids Res.</i> 14:7737-7749 (1986); and					
		Del Tito, Jr., et al. "Effects of a Minor Isoleucy 1 tRNA on Heterologous Protein Translation in Escherichia coli.", <i>Journal of Bacteriology</i> , December 1995, Vol. 177, No.: 24 pages 7086-7091.					
EXAMINER					DATE CONSIDERED		
<p>*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to Applicant.</p> <p>**Copies of references not provided at the time of this submission.</p>							